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Report of the World Bank on poverty statistics

Note by the Secretary-General

In accordance with Economic and Social Council decision 2017/228 and past practices, the Secretary-General has the honour to transmit the report of the World Bank on poverty statistics. Because reducing poverty is a goal in both national and international development agendas, poverty statistics are central to monitoring development progress. The report has four purposes: (a) to identify concepts, definitions, methods and data requirements commonly utilized in government measurement of national poverty, with a focus on monetary poverty; (b) to summarize the history and foundation of international poverty measures and to explain how international poverty statistics rely on national data, methods and definitions; (c) to assess the availability of poverty statistics, highlight data gaps, and review the challenges associated with comparability and disaggregation; and (d) to outline means of improving national and international poverty statistics so as to better report progress towards achievement of the Sustainable Development Goals.

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Report of the World Bank on poverty statistics

I. Introduction

1. Reducing poverty is a headline goal in the international development agenda. The first target of the Millennium Development Goals was to halve, between 1990 and 2015, the proportion of people living in extreme poverty. The first of the Sustainable Development Goals, which were adopted by the General Assembly in its resolution 70/1 of 25 September 2015, is to end poverty in all its forms everywhere by 2030.[1] National Governments, development agencies and non-governmental organizations are also committed to reducing, and ultimately eradicating, poverty in all its multiple forms and dimensions. Thus, monitoring the number of people who live in poverty has become increasingly important for national Governments and statistical offices, as well as for international organizations.

2. Sustainable Development Goal 1 sets out both national and international measures of poverty. Target 1.1 ("By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day") is tracked by indicator 1.1.1, which measures the "proportion of population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)" (see General Assembly resolution 71/313 of 6 July 2017, annex). Reflecting the recognition that countries have different notions of poverty, the aim of target 1.2 is "by 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions". This target is measured by indicators 1.2.1 ("Proportion of population living below the national poverty line, by sex and age") and 1.2.2 ("Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions"). Disaggregation by groups and monitoring poverty in "all its dimensions" raise challenges for current approaches to poverty statistics — challenges not confronted within the context of the Millennium Development Goals.

3. Although national household surveys and poverty measurements are the foundation for the production of all poverty statistics, national and international, there is substantial heterogeneity exhibited in terms of how poverty is measured and in the resulting statistics, not only between countries but also within countries over time. The present report both summarizes customary methods for measuring poverty and illustrates how national data and methods inform international poverty measures. One goal is to review the approaches to measuring poverty commonly used by statistical offices and international organizations and to assess how well the poverty statistics available respond to the poverty-related goals and reporting requirements under the Sustainable Development Goals. This report does not, however, provide an exhaustive review of various conceptualizations and methods used. Its main focus is on measures of monetary poverty. The increasing use of non-monetary measures merits a separate report.

4. The availability of both national and international poverty statistics improved considerably during the Millennium Development Goals period, but the gaps are still substantial. In particular, the focus of the Sustainable Development Goals on leaving no one behind and disaggregating by subgroups, such as sex, age, employment status

[1] For details, see https://sustainabledevelopment.un.org/sdg1 and the report of the Economic and Social Council of 5 May 2017 (E/2017/64), entitled "Eradicating poverty in all its forms and dimensions through promoting sustainable development, expanding opportunities and addressing related challenges".

and geographical location, poses several new data- and measurement-related challenges. Although, on the whole, more data are available, they are not always comparable within countries over time or across countries owing to differing measurement methods. Clearly, continued investment in and strengthening capacity for household survey work will be crucial.

5. The scope of this report encompasses: a review of common poverty measurement concepts, definitions, and methods (sect. II); an outline of the data requirements for measuring national poverty (sect. III); a summary of the history of international poverty measures and a discussion on how international poverty statistics rely on national definitions, methods, and data (sect. IV); an assessment of the availability of poverty statistics, the data gaps and the comparability- and disaggregation-related difficulties that can arise (sect. V); and an outline of the means of improving national and international poverty statistics, especially in terms of reporting on progress in achieving the Sustainable Development Goals (sect. VI).

II. Concepts and methods: an overview[2]

6. To measure poverty, it is fundamental to define one or multiple dimensions of welfare against which to assess whether people are deprived. The present section discusses (a) concepts underlying measurement of both monetary (consumption and income) and non-monetary welfare and (b) how countries usually estimate poverty in terms of monetary welfare.

A. Measures of welfare

1. Monetary measures of welfare

7. Although welfare and poverty are inherently multidimensional concepts, in national and international poverty statistics, consumption and income are commonly used as measures of welfare. Consumption and income refer to the resources people absorb or have command over. The consumption measure is based on the estimated value of food and non-food items consumed by households. Non-food items often include clothing, services, transportation and the estimated use value of housing and durable goods. To the extent that market prices reflect, at least in part, the relative value that people place on these items, the valuation of consumption is a useful indicator of general welfare.[3] Because these measures cover many different items (or, for income, the ability to purchase these different items), the measures can be thought of as reflecting multidimensional aspects of welfare, where the price for each item provides a relative "weight" for each dimension.

8. Not all components of welfare can be acquired in markets, however: markets are imperfect and for some dimensions of welfare, no market exists, i.e., the conditions set out in footnote 3 below do not hold in practice. Thus, a monetary

[2] While the Statistical Commission did decide to create an Expert Group on Poverty Statistics (Rio Group) at its 1996 session, poverty measurement has not been discussed at the recent sessions of the Commission. In September 2006, the Rio Group published a *Compendium of Best Practices in Poverty Measurement* (Rio de Janeiro, September 2006) which brought together a variety of perspectives on the measurement, interpretation and use of poverty statistics.

[3] Economic theory suggests that if markets were complete and perfectly efficient (with, e.g., no missing markets, public goods, or externalities), prices would reflect social assessments of value, and the value of total consumption would be a statistic sufficient for measuring welfare.

measure alone cannot fully reflect key dimensions of welfare, such as life expectancy, public goods and services, security and freedom. Such aspects can in some instances be measured directly, in multidimensional approaches to assessing poverty, as discussed below.

9. Income and consumption are often treated as if they are interchangeable, but it is important to distinguish between them, both conceptually and in terms of the reliability of the estimates they produce. Income provides a measure of *opportunities* to consume and save for the future. Consumption, which reflects the *realization* of those opportunities, is a more direct measure of material welfare. Thus, income and consumption can be considered complementary measures of welfare. However, consumption is typically viewed as, conceptually, the preferred measure of monetary welfare to be used in poverty measurement.[4] The importance of such conceptual distinctions is reflected in the following example: for someone to live with zero consumption is an implausibility but there are many people with zero income over a given period who in fact may not be poor. Given the prevalence of zero incomes in survey data, the distinction between consumption and income is particularly important in terms of "ending" poverty — a goal that may be unattainable if the measure is income.

10. Despite the preference for consumption conceptually, the reliability of *measured* consumption and income varies significantly. In highly informal economies, for example, where a significant proportion of the population are subsistence farmers, it is typically assumed that people can answer questions about what they consume much more reliably than about their income. In contrast, in countries where most people are engaged in formal labour markets and receive paychecks regularly, reported monthly income may be more reliable than recollections of everything that has recently been consumed.

11. In aggregating income and consumption data for the purpose of poverty analysis, households are often used as the unit of analysis;[5] however, the fact that households of different size and composition have different needs is not a trivial consideration. It is important that assessments of welfare take into account how needs vary between age groups and, potentially, according to the sex of household members.[6] Furthermore, needs may depend on the size of the household, reflecting the fact that larger households can economize on the purchase of some products, especially consumer durables.[7]

[4] Bruce D. Meyer and James X. Sullivan, "Measuring the well-being of the poor using income and consumption", *Journal of Human Resources*, vol. 38, Special issue on income volatility and implications for food assistance programs (2003), pp. 1180–1220. https://doi.org/10.2307/3558985.

[5] Angus Deaton and Salman Zaidi, *Guidelines for Constructing Consumption Aggregates for Welfare Analysis. Living Standards Measurement Study (LSMS) Working Paper*, No. 135 (Washington, D.C., World Bank, 2002). Available at https://openknowledge.worldbank.org/handle/10986/14101.

[6] Brigitte Buhmann and others, "Equivalence scales, well-being, inequality, and poverty: sensitivity estimates across ten countries using the Luxembourg Income Study (LIS) database", *Review of Income and Wealth*, vol. 34, No. 2 (June 1988), pp. 115–142. https://doi.org/10.1111/j.1475-4991.1988.tb00564.x.

[7] Peter Lanjouw and Martin Ravallion, "Poverty and household size", *Economic Journal*, vol. 105, No. 433 (November 1995), pp. 1415–1434. https://doi.org/10.2307/2235108.

2. Measures of welfare in multiple dimensions

12. Although monetary measures of welfare are the ones most commonly used by Governments for poverty today, the multidimensionality of welfare is not only widely recognized, but also embodied in the Sustainable Development Goal commitment to reducing poverty in all its forms and dimensions. Sustainable Development Goal target 1.2 (and indicator 1.2.2) explicitly refers to halving the proportion of men, women, and children of all ages living in poverty "in all its dimensions according to national definitions". Furthermore, even beyond the specific poverty goals and targets, many other Sustainable Development Goals can be considered to encompass dimensions of welfare relevant to the measurement of poverty.[8]

13. An individual's welfare can be measured beyond income or consumption in terms of health, nutrition status, literacy, freedom, security and subjective well-being (e.g., happiness and life satisfaction). It is beyond the scope of this report to review the wide range of methodologies proposed to assess the many dimensions of poverty comprehensively. [9] However, given the attention given by the Sustainable Development Goals to poverty, directly and indirectly, it is useful to summarize several common approaches to conceptualizing and measuring multidimensional poverty.

14. Of the two broad groups of methods used to measure multidimensional poverty, one group of methods assesses dimensions in isolation and often draws from a variety of surveys and administrative data. These are often referred to as "marginal methods", whereby deprivations can be displayed side by side, and are therefore also referred to as constituting a "dashboard approach". Although the approach can measure how many people live below a certain threshold in a certain dimension, it cannot easily assess how many people are deprived in a variety of ways. Each indicator or dimension is assessed independently; however, because this approach fails to reveal joint distributions, it cannot identify who is "multidimensionally poor". Examining each dimension separately may also reveal opposing trends, which can lead to ambiguous assessments of changes in overall welfare or poverty. To address the problem of how to interpret mixed signals arising from different dimensions, the multiple indices can be combined into a single measure; however, this approach still does not identify joint deprivations, which many consider central to assessing multidimensional poverty.

15. A second general approach extends beyond considering multiple measures side by side by focusing on overlapping deprivations, often using Venn diagrams to illustrate those overlaps. Another version of this approach relies on statistical techniques that collapse information on covariation of all the dimensions into a scalar ranking. This includes the application of techniques such as factor analysis, principal component analysis, multiple correspondence analysis and cluster analysis to assess correlations in deprivations and identify groups of individuals facing similar levels of joint deprivations. Other approaches include stochastic dominance analysis of joint deprivations; and analysis of fuzzy sets, which also examines joint deprivations, but

[8] See the report of 8 May 2017 of the Secretary-General to the Economic and Social Council at its 2017 session (E/2017/69) entitled "Beyond gross domestic product: multidimensional poverty and the Sustainable Development Goals", for approaches to reducing multidimensional poverty.

[9] For details, see Sabina Alkire and others, *Multidimensional Poverty Measurement and Analysis* (Oxford, Oxford University Pres, 2015), chap. 3, entitled "Overview of methods for multidimensional poverty assessment", and Francisco H.G. Ferreira and Maria Ana Lugo, "Multidimensional poverty analysis: looking for a middle ground", *World Bank Research Observer*, vol. 28, No. 2 (August 2013), pp. 220–235, upon which the present section draws.

incorporates the ambiguity associated with identifying who is deprived. All of these approaches require that indicators for each dimension be captured for each household in a single data set, usually through a multi-topic survey.

16. A method used in many countries is the counting approach proposed by Alkire and Foster, which aggregates overlapping dimensions.[10] This method first identifies dimensions of poverty, followed by indicators for each dimension, and thresholds for each indicator below which individuals are considered deprived. The f dimensions in which each individual is deprived are then added up based on "importance" weights. A deprivation threshold, in terms of the count of weighted deprivations, is used to identify which individuals are multidimensionally poor. The proportion of the population that are deprived forms the headcount ratio of multidimensional deprivation. The simple headcount approach has been criticized for failing to satisfy "dimensional monotonicity", which requires that the index change if any individual ceases to be deprived in any dimension. Thus, Alkire and Foster propose an adjusted headcount ratio which multiplies the simple headcount ratio by average deprivation among the poor.

17. Because any country with a multi-topic household survey should be able, in theory, to develop a set of measures for multidimensional poverty, well-designed surveys will be vital for monitoring this goal.

B. Poverty lines for monetary measures

18. Once a measure of welfare is defined, the poverty line, below which an individual is considered poor, needs to be set. There are several approaches to setting the poverty line, three of which are described below.

1. Absolute poverty lines

19. *Cost of basic needs (CBN).* The cost of basic needs approach, often used to set the national poverty line, first estimates the cost of acquiring enough food for adequate nutrition, which is usually set at 1,800–2,300 calories per person per day, and then adds a component for essential non-food consumption, such as housing, clothing and other goods and services. This component is often assessed by examining the amount spent on non-food items by those who are consuming the minimum acceptable nutrition basket. The poverty line is the sum of basic food and non-food costs.

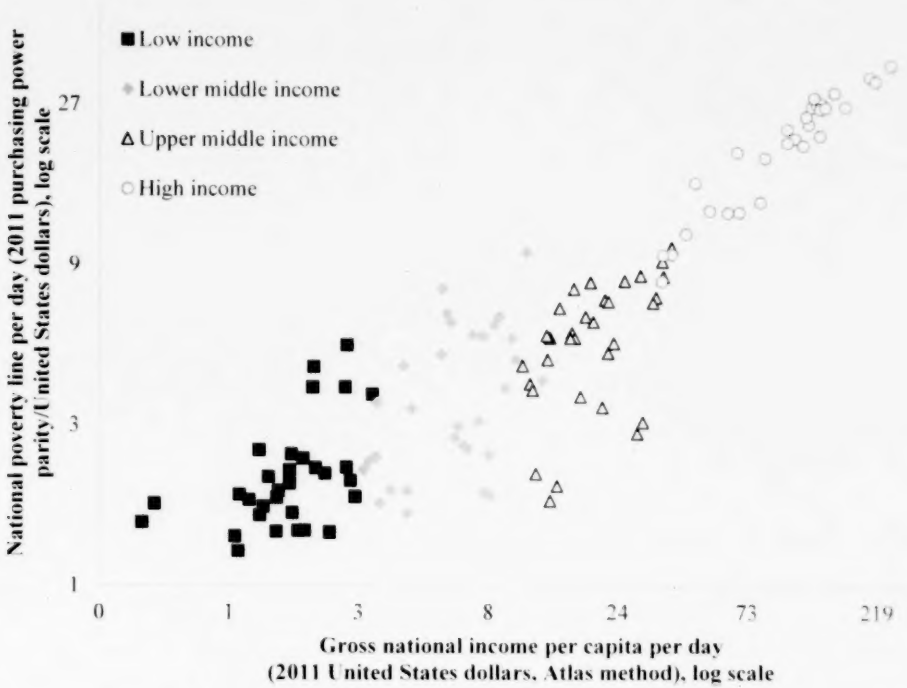
20. *Food-energy-intake (FEI) method.* An alternative approach used by some countries is the food-energy-intake method, which assesses the relationship between expenditure (or income) and caloric intake. The poverty line is defined as the average total spending on food and non-food items by those who are meeting basic caloric requirements. The food-energy-intake method is useful when detailed information on the price of food consumed is not available.

21. Cost of basic needs and food-energy-intake poverty lines are generally considered absolute. Updated for changes in prices over time, they continue to represent the same level of material welfare or absolute needs. However, such absolute poverty lines are typically higher in richer countries and are in fact revised

[10] Sabina Alkire and James Foster, "Counting and multidimensional poverty measurement", *Journal of Public Economics*, vol. 95, Nos. 7–8 (August 2011), pp. 476–487.

upward as countries become richer (see figure I), which suggests that even definitions of absolute poverty have a relative element.

Figure I
Poverty lines across the world



Source: Dean Jolliffe and Espen Beer Prydz, "Estimating international poverty lines from comparable national thresholds", *Journal of Economic Inequality*, vol. 14, No. 2 (June 2016), pp. 185–198.

2. Relative poverty lines

22. The relative nature of poverty lines is made explicit when they are set as a constant proportion of the overall distribution of income or consumption of a society, often 50 or 60 per cent of median or mean income or consumption.[11] While relative poverty lines are common in Organization for Economic Cooperation and Development (OECD) and European Union member countries, they can be somewhat confusing when everyone becomes better off but poverty does not drop. Specifically, if the relative poverty line is a fixed proportion of the mean or median income, and if everyone's income increases by the same percentage, poverty will remain unchanged.

[11] Sustainable Development Goal indicator 10.2.1 measures "Proportion of people living below 50 per cent of median income, by sex, age and persons with disabilities".

C. Measures of poverty

23. With a measure of welfare and a poverty line, it is possible to calculate measures of poverty in a society, in a group or in the world. Most popular is the poverty headcount ratio, which measures the share of the relevant population whose income or consumption is below the poverty line. The index is also often used in non-monetary measures of poverty to reflect the share of the population that does not reach a defined threshold, such as minimum years of education.

24. A second measure is the "poverty gap", which is affected by both the total number of poor people and the distance between the average standard of living of the poor and the poverty line. The poverty gap expresses average income shortfall as a proportion of the poverty line, where the average is for the entire population and counts the non-poor as having a shortfall of zero. For example, for a poverty gap of 0.05 the average shortfall is 5 per cent of the value of the poverty line. Multiplying the poverty gap by the value of the poverty line and the population provides an estimate of the income shortfall of the poor. The poverty gap is one of the Foster-Greer-Thorbecke poverty measures.[12]

25. Both measures can be calculated for individuals and households. Although data on living standards and poverty are generally based on household per capita consumption or income, poverty is typically defined in terms of individuals and is therefore most often reported in terms of the total number of poor individuals in a country.

III. Data sources

A. Household surveys

26. Household surveys are the most central data source for national and international poverty statistics. Most fundamentally, household surveys provide the data necessary to construct the welfare indicators used to measure poverty, such as total spending on consumption and total income. Consumption surveys also collect the data on food energy consumption used by many countries to set a poverty line. In measuring poverty, the most essential modules are those related to household consumption patterns for both food and non-food goods and services, as well as information on income from employment, self-employment, and business activities. Often, household surveys are also an important source of price data, either from the household consumption module or from separate price modules (see subsect. B below).

27. In isolation, the raw number or share of the poor is of limited usefulness to policymakers. However, when combined with a descriptive profile of the demographic and socioeconomic characteristics of the poor, along with determinants of poverty, this larger set of poverty statistics is of great value for the improved design of poverty reduction policies. For this reason, data collection for poverty statistics focuses on multi-topic household surveys which collect information on the many dimensions of living standards and economic activities. For example, while there is significant variation across countries with regard to what is included in the questionnaire, it is not uncommon for a household survey to collect information on

[12] James Foster, Joel Greer and Erik Thorbecke, "A class of decomposable poverty measures", *Econometrica*, vol. 52, No. 3 (May 1984), pp. 761–766.

sector of employment, sociodemographic variables like education, health, migration and fertility, and sometimes anthropometric information, such as the height and weight of children. These multi-topic household surveys are the primary sources used by analysts to inform policymakers on the factors underlying poverty and the candidate policies for reducing it.

B. Price data

28. Adjusting for time and space variations in prices is essential for correct comparisons of material welfare and ensuring that a poverty line reflects the same level of welfare in different places and at different times. To hold the monetary welfare measure (or poverty line) constant, intertemporal price indices are typically used. The most common is the national consumer price index (CPI), a measure of the value of a basket of goods and services typically consumed by households. Occasionally, alternative intertemporal deflators estimated from price or unit value data in household surveys or other sources are used, generally when consumer price index data are non-existent or of questionable accuracy.

29. Prices can vary not only across time but also across space within countries. For example, food and housing are typically cheaper in rural than in urban areas. Poverty analysts therefore often adjust for domestic spatial (geographical) price differences at a given point in time. Without such adjustments, living standards can be underestimated in areas with relatively lower prices and overestimated in areas where prices are higher. To reduce this type of error, many countries adjust prices either by using separate poverty lines for urban and rural areas (or other subnational geographies) or by adjusting consumption- and income-based welfare aggregates to account for price differences.

30. Useful adjustment of prices depends on good price data, which may be collected through household surveys, as part of the data collected for a parallel consumption or community price module, or though specialized price surveys, sometimes as part of data collection for the consumer price index.

C. Census and population data

31. Measurement of poverty also depends on many other aspects of the national statistical system. For instance, population data, typically from housing and population censuses, are used in sampling for household surveys and are essential for creating weights (adjustment factors that account for the varying probability of an individual's being included in the survey) to ensure that survey estimates are representative of the country or of specific geographical areas. Outdated or low-quality census data can lead to inefficient samples and thus to large margins of errors, or even biased estimates of poverty. Flawed population data can misestimate poverty by millions. Census data are also essential to producing geographical poverty estimates that are more granular than what are typically derived from household surveys. The small-area estimation technique combines poverty or consumption estimates from household surveys with census data to impute a spatially

disaggregated poverty measure using variables common to the household survey and the census.[17]

IV. Global measures of monetary poverty

32. Poverty measurement is typically a national exercise, with Governments conducting household surveys, other forms of data collection, and analysis, sometimes with technical assistance from international or regional bodies. These efforts usually entail assessing and comparing poverty within countries across time, groups and geographical areas. However, for purposes of international poverty statistics and comparisons, researchers and international organizations build on national data and methodologies to produce internationally comparable estimates. Thus, the production process and methodologies used for national and international poverty statistics are closely related to international poverty measurement depending fundamentally on availability of national household survey data, as well as national poverty statistics and methods.

A. Adjusting for price differences between countries

33. Income and consumption measures from national household surveys, and national poverty lines, are typically denominated in local currency units. To compare living standards between countries, however, consumption or income must be expressed in common units. While one option might be to use market currency exchange rates, it is widely recognized that these rates fail to accurately reflect relative purchasing power.[18] For example, one United States dollar converted at market exchange rates typically buys more goods and services in a low-income country than in the United States of America. One reason for this is that non-traded goods, and (especially) services, are typically cheaper in poorer countries.[19] Thus, using market exchange rates to convert consumption or income data underestimates the real standard of living in low-income countries.

34. International poverty measurement therefore uses exchange rates based on purchasing power parity (PPP) conversion factors for private consumption available from the International Comparison Program (ICP). These are essentially exchange rates that ensure that a dollar has the same purchasing power, in terms of the goods and services that it buys, across countries, thereby ensuring comparability.

35. PPP factors convert the value of consumption from the local currency unit into a common currency (i.e., the United States dollar) in a manner that allows for comparability across countries. PPPs actually enter international poverty calculations at two stages. First, they are used in estimating an international poverty line based on national poverty lines (see sect. VI on international poverty statistics). Then, to assess poverty in each country, PPPs are used to convert the international poverty line into

[17] Chris Elbers, Jean O. Lanjouw and Peter Lanjouw, "Micro-level estimation of poverty and inequality", *Econometrica*, vol. 71, No. 1 (January 2003), pp. 355–364. https://doi.org/10.1111/1468-0262.00399.

[18] Alan M. Taylor and Mark P. Taylor, "The purchasing power parity debate", *Journal of Economic Perspectives*, vol. 18, No. 4 (fall 2004), pp. 135–158. https://doi.org/10.1257/0895330042632744.

[19] Jacob A. Frenkel, "Collapse of purchasing power parities during the 1970s", *European Economic Review*, vol. 16 (May 1981), pp. 145–165.

local estimates or, especially, to convert consumption and income distributions from local currencies to PPP dollars.

B. Defining and updating international poverty lines

16. The precise methods used to measure poverty internationally have changed over time, but one guiding principle throughout has been to anchor estimates on national methods of poverty measurement and data.[7] The international extreme poverty line has typically been set to reflect how the world's poorest countries estimate a minimum threshold of living that meets basic needs in their societies. Absolute national poverty lines, when well constructed, are anchored on core caloric needs but also reflect country context and thus allow for substantial variation in non-food needs. The requirements for being considered poor are often debated by national politicians, civil society and the press, which can often ensure a common understanding of what are minimum needs.

17. Among the first to estimate international poverty were Ahluwalia, Carter and Chenery, who used India's national poverty threshold to estimate the prevalence of poverty in the world, using 1975 PPP figures.[8] Their estimate was based on consumption and income data for 25 countries. Not only was this the first attempt to measure global poverty against a common absolute poverty line but it also inaugurated the practice of measuring international poverty based on national poverty standards and the use of PPP exchange rates to adjust for price differences not reflected in market exchange rates.

18. Since the 1990s, the World Bank has defined the international poverty line based on a sample of national poverty lines in some of the world's poorest countries. In 1991, Ravallion, Datt and van de Walle examined 33 national poverty lines and identified six countries (Bangladesh, Indonesia, Kenya, Morocco, Nepal and Tanzania) as among the poorest in the sample, all were within $1 of a poverty line of US$ 31 per person per month at 1985 PPPs. This was the basis for the "dollar-a-day" global poverty line.[9]

19. Estimates of global poverty are regularly updated with new household-survey data and expanding country coverage, albeit with some substantial modifications in data and estimates. These modifications have typically occurred in response to each new ICP price data-collection exercise, and the subsequent release of new PPP exchange rates reflecting the latest information on relative prices across countries. In 2008, price data from the 2005 International Comparison Program data, and new data on national poverty lines, led to a revision of the poverty line upward to $1.25, based on the average of the national poverty lines of 15 of the poorest countries, converted to United States dollars at 2005 PPPs. In 2015, with the 2011 PPPs recently available with revised information on relative prices across countries, the World Bank poverty line was updated again. The value of the same 15 national poverty lines (from the same countries and years) at 2011 PPPs would give an average of $1.88 (rounded to $1.90), which is currently the international poverty line used by the World Bank.

[7] For a discussion of this approach, see Robert Allen, "Absolute poverty: when necessity displaces desire", *American Economic Review*, vol. 107, No. 12 (December 2017), pp. 3690–3721. https://doi.org/10.1257/aer.20161080.

[8] Montek S. Ahluwalia, Nicholas G. Carter and Hollis B. Chenery, "Growth and poverty in developing countries", *Journal of Development Economics*, vol. 6, No. 3 (1979), pp. 299–341.

[9] Martin Ravallion, Gaurav Datt and Dominique van de Walle, "Quantifying absolute poverty in the developing world", *Review of Income and Wealth*, vol. 37, No. 4 (December 1991), pp. 345–361.

Table 1 presents these national lines converted at 2005 and 2011 PPPs. By keeping the national poverty lines the same, the poverty line can be seen as having been fixed with reference to its definition, although its value changed.

Table 1
Re-estimating the $1.25 line at 2005 PPPs, using the 2011 PPPs

Country	*Poverty line year(s)*	*2005 PPP*	*2011 PPP*	*Consumer price index 2011 (2005=100)*	*Poverty line 2005 PPP*	*Poverty line 2011 PPP*
Malawi	2004–2005	56.92	78.02	214.6*	0.86	1.34
Mali	1988–1989	289.68	221.87	119.8	1.38	2.15
Ethiopia	1999–2000	2.75	5.44	297.1	1.35	2.03
Sierra Leone	2003–2004	1 396.21	1 767.19	203.9*	1.69	2.73
Niger	1993	267.33	228.75	116.3	1.10	1.49
Uganda	1993–1998	744.62	946.89	178.0	1.27	1.77
Gambia	1998	10.34	10.83	129.3	1.48	1.82
Rwanda	1999–2001	236.75	246.83	157.8	0.99	1.50
Guinea-Bissau	1991	284.28	248.24	124.8	1.51	2.16
United Republic of Tanzania	2000–2001	482.45	585.52	169.9	0.63	0.88
Tajikistan	1999	0.93	1.88	334.2*	1.93	3.18
Mozambique	2002–2003	11.63	15.53	173.5	0.97	1.26
Chad	1995–1996	327.57	251.30	112.4	0.87	1.28
Nepal	2003–2004	26.47	25.76	164.8	0.87	1.47
Ghana	1998–1999	0.45	0.79	295.2*	1.83	3.07
Mean					**1.25**	**1.88**

Source: Francisco H.G. Ferreira and others, "A global count of the extreme poor in 2012: data issues, methodology and initial results", *Journal of Economic Inequality*, vol. 14, No. 2 (June 2016), pp. 141–172.
Note: Countries marked with an asterisk (*) use a consumer price index that is different from that reported in World Bank, World Development Indicators.

40. This relatively large and heterogeneous revision in the PPPs across countries and regions led to some changes to the poverty numbers at the country level. However, at the global level, updating the poverty line to 2011 PPPs led only to a minor revision, with the global poverty rate for 2011 being revised down from 14.5 per cent (or 1,011 million people) under the old method ($1.25/day at 2005 PPPs), to 14.2 per cent (or 987 million) under the new method ($1.90 at 2011 PPPs). Compared with the incorporation of the 2005 PPPs and update of the international poverty line from $1.08 to $1.25 at corresponding PPPs, the most recent revisions were much smaller.

C. Aligning for aggregate estimates

41. Since survey estimates of poverty are not available for every country every year, producing aggregate poverty estimates for certain years requires some realignment of the data available. Aggregate international poverty estimates for a given reference year are adjusted on the basis of national accounts data on the growth of the economy. For countries where household survey data are not available for the reference year,

growth rates from national accounts data are used to project consumption or income forward or backward as needed to "line up" estimates with reference years so that poverty can be estimated at the same point in time for all countries.

42. National accounts data represent the activities of economic actors — individuals, businesses and government — at the most aggregated level. Usually produced annually, they provide the basis for calculating gross domestic product (GDP) and household final consumption expenditures. National income accounts are highly standardized and widely available at a relatively high frequency. However, growth rates drawn from national accounts and from surveys are known to differ substantially, so that using the line-up method over long periods can cause substantial error and uncertainty in global estimates.

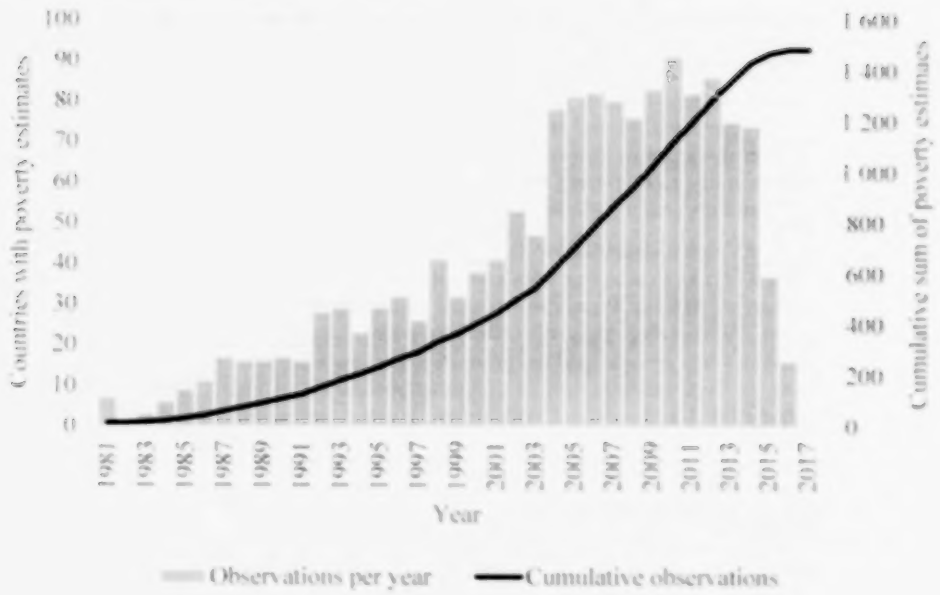
43. As noted, population data are fundamental for ensuring that estimates are representative in terms of both a sample frame and corresponding expansion weights for sample surveys. Population data are also important for ensuring representativeness when aggregating poverty estimates across countries. In aggregating poverty estimates for regional or other groupings of economies and countries, the World Bank uses its own database, which compiles population estimates derived from various international and national collections. It does not aggregate poverty estimates at national poverty lines, because these are not comparable.

V. Data availability and comparability

A. National and international estimates

44. Data for monitoring monetary poverty indicators have become ever more available in recent years (see figure II). The World Bank Poverty and Equity Database contains estimates for 168 countries, and each year for the past decade new estimates have been available for about 80 countries. Poverty estimates are now available for 1,500 country-year observations — more than triple the numbers that were available in the early 2000s. The decline in the availability of estimates for the most recent years was caused by delays between the time when surveys were conducted and the time when the new estimates became available in international databases.

Figure II
Country poverty estimates by year, 1981–2017



Source: Poverty and Equity Database.
Note: Country-level poverty estimates available by year (either at national or at international poverty line), based on tabulation of SI.POV.DDAY and SI.POV.NAHC.NC.

45. Although the volume of poverty statistics has grown rapidly, a number of countries do not have a sufficient number of estimates to enable them to track poverty over time: thorough assessment of country poverty trends requires frequent and comparable data. For example, to assess whether national poverty is rising or falling requires at least two comparable data points within a reasonable interval. Many countries, especially richer ones, have annual estimates available, but for many others, observations are far less frequent. In an effort to address this shortfall, the General Data Dissemination System (GDDS) was developed to serve as a structured process through which member countries of the International Monetary Fund (IMF) commit voluntarily to improving the quality of the data compiled and disseminated by their statistical systems in accordance with a set of recommended standards. As one such standard, the Dissemination System recommends that poverty statistics be updated at least every three to five years, a useful benchmark.[15] Yet of the 193 States Members of the United Nations, 68 (35 per cent) had no poverty estimates available between 2011 and 2015 and another 44 (23 per cent) had only one estimate. About 42 per cent (81) had at least two estimates and could carry out the General Data Dissemination System recommendation.

46. For an assessment of survey data which can be used to estimate recent poverty trends, the data in the Global Database on Shared Prosperity provide useful information. These data require two comparable income or consumption survey

[15] http://dsbb.imf.org/pages/GDDS/TableB.aspx.

estimates within a three- to seven-year period from approximately 2009 to 2014. In the most recent data set, estimates were available for 95 economies, representing about 62 per cent of the world's population, which means that about 38 per cent live in countries where currently it is not possible to track recent poverty trends. Table 2 presents the availability of data for States Members of the United Nations by the regions and groups used in the Standard Country or Area Codes for Statistical Use maintained by the Statistics Division of the Department of Economic and Social Affairs of the Secretariat. There is a significant lack of availability in poorer regions: 81 per cent of the developed countries have enough data to calculate poverty trends, but in Africa just under 30 per cent (16 of 54 countries, representing 35 per cent of the population) have enough of such data. Among least developed countries, surveys from 14 of 48 countries represent just 41 per cent of the population.

Table 2
Availability of data for comparing poverty trends, by region or grouping, in the approximate period 2009–2014

Region or grouping (Standard Country or Area Codes for Statistical Use (M49))	*Number/percentage of countries with data*	*Share of population represented in data (percentage)*
Africa	16/54 (30%)	35
Americas	17/35 (49%)	89
Asia	21/47 (45%)	58
Europe	38/43 (88%)	99
Oceania	1/14 (7%)	2
Least developed countries	14/48 (29%)	41
Developed countries	39/48 (81%)	84
Developing countries	54/145 (37%)	57
Total States Members of the United Nations	93/193 **(48%)**	**62**

Note: Based on data available in the Global Database on Shared Prosperity, circa 2009–2014 (http://www.worldbank.org/en/topic/poverty/brief/global-database-of-shared-prosperity). The database tracks annualized consumption or income growth of the bottom 40 per cent for each country. The database contains estimates for 95 economies, 93 of which are States Members of the United Nations, used in this analysis. The analysis uses the classification of countries by Standard Country or Area Codes for Statistical Use (M49). Population numbers are for 2015 or are the latest available (from World Bank, World Development Indicators).

B. Data quality and comparability

47. Although data availability has improved, the availability of comparable estimates for tracking recent poverty trends remains limited. When surveys are not comparable over time, they cannot be relied on for monitoring poverty trends. Differences in how surveys are conducted over time limits comparability. Often, as economies evolve, surveys are updated to better capture consumption patterns; survey changes may also be introduced for other reasons, such as budget requirements. Questionnaires are often changed with the intent of improving measurement, but, often, little consideration is given to the possibility of creating non-comparable series.

48. Changes to questionnaires can have substantial impact on poverty estimates and make it difficult to answer simple questions, regarding, for example, whether or not

poverty has declined. In an experiment conducted in the United Republic of Tanzania, for instance, different consumption questionnaires were randomly assigned to different subsamples.[20] The experiment found that large variations in measured consumption and the resulting poverty estimates could be attributed to the differences in the questionnaires. For example, changing the recall period for consumption from one week to two (while leaving everything else the same) pushed up poverty headcount estimates in the experimental sample from 55 to 63 per cent. Other differences in questionnaires — for example, with respect to the extensiveness of the list of consumption items queried, or the order in which items are listed — have also been found to compromise comparability.[21]

49. To improve comparability, statistical techniques such as survey-to-survey imputation can sometimes be used to overcome challenges generated by changes in questionnaires.[22] Alternatively, experimental design can be utilized to help both assess the effect of changes in household surveys and restore comparability. Increasingly, statistical offices, when making substantial changes to questionnaires, are advised to introduce experimental design, in order to assess more precisely how those changes impact measures.[23]

50. Differences in survey methods and questionnaires are even larger across countries. Some degree of post-harmonization can be carried out, but many differences are irreconcilable. Several initiatives designed to harmonize survey design practices attempt to improve comparability between countries, but such harmonization can compromise comparability within countries. Ultimately, countries and international agencies that are considering questionnaire changes need to be well aware of the trade-offs.

VI. Poverty statistics: the way forward

51. Throughout the world, there has already been considerable progress made in both measuring and combating poverty, but expanding demands for both international and national reporting on the Sustainable Development Goals are likely to lead to a similar expansion of the requirements.

A. Leaving no one behind: new expectations for poverty statistics

52. While disaggregated reporting "by sex, age, employment status and geographical location (urban/rural)" may be central to the Sustainable Development Goal commitment to leaving no one behind, it still raises numerous problems related to poverty statistics, which are usually measured at the household level and based on the assumption that resources are distributed equally within households.

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[20] Kathleen Beegle and others, "Methods of household consumption measurement through surveys", *Journal of Development Economics*, vol. 98, No. 1 (May 2012), pp. 3–18.

[21] *Household Sample Surveys in Developing and Transition Countries*, Studies in Methods, Series F, No. 96 (United Nations publication, Sales No. E.05.XVII.6). Available at https://unstats.un.org/unsd/hhsurveys/pdf/Household_surveys.pdf.

[22] For an early example of survey-to-survey imputation, see Andrew Gelman, Gary King, and Chuanhai Liu, "Not asked and not answered: multiple imputation for multiple surveys", *Journal of the American Statistical Association*, vol. 93, No. 443 (September 1998), pp. 846–857.

[23] Roger Tourangeau, "Recurring surveys: issues and opportunities" (2003), report to the National Science Foundation, based on a workshop held on 28 and 29 March 2003. Available at https://www.nsf.gov/sbe/ses/mms/nsf04_211a.pdf.

53. In the report entitled *Poverty and Shared Prosperity 2016: Taking on Inequality*, the World Bank published subgroup estimates for children (age groups 0–4, 5–9, 10–14 and 15–17), rural/urban residence, and some occupations and is now working to make disaggregated reporting the standard. However, lack of comparable definitions of groups surveyed can undermine comparability. For example, countries often define rural and urban areas differently, and surveys may also capture employment status in very different ways. Ex-post harmonization of definitions and survey instruments thus becomes important for ensuring the comparability of both domestic and international poverty statistics.

54. Data limitations make sex disaggregation of poverty statistics difficult. For example, the World Bank has so far not been reporting poverty statistics by sex (male/female), as suggested under the Sustainable Development Goals, and the Commission on Global Poverty. Consumption and income information is usually collected for the household as a whole. Some data may be collected on individual incomes, but many aspects of consumption are difficult to disaggregate by individuals, much less by sex. Thus, estimates of income and consumption distributions used for poverty measurement typically ignore intra-household inequalities, assigning to everyone in the household the same level of material welfare. In particular, sex-disaggregated poverty statistics that assume equal sharing within households can be deeply misleading. Experimental approaches are currently under way to better capture within-household inequalities.

55. Another measurement problem posed by the Sustainable Development Goals is inherent in the goal of eradicating poverty by 2030 as measured by the international poverty line. The target of ensuring that, by this measure, no one lives in extreme poverty makes it crucial that surveys capture the people who are marginalized, homeless or otherwise not likely to be part of standard samples. For example, where 30 per cent of the population is poor, excluding 3 per cent of the population from the sample because they are hard to reach may not fundamentally change the general national profile of poverty, although the sample would not be fully representative. For the Sustainable Development Goal target, capturing the entire population, especially marginalized groups that are likely to be poorer than the rest of the population, is fundamental to assessing whether poverty is indeed being eradicated.

56. Similarly, as discussed in section V, in several countries, especially low-income countries and conflict-affected or fragile States where poverty tends to be pervasive, data needed for poverty measurement are often dated, sparse or not available at all. Unlike the Millennium Development Goals, the Sustainable Development Goals are explicitly global in coverage; hence, efforts to better collect national poverty measures from high-income countries have begun. Many high-income countries do not have official national poverty lines but instead rely on regional standards, such as the Eurostat relative poverty measures. Although, traditionally, United Nations and World Bank measurement of international poverty has focused on low- and middle-income countries, the Sustainable Development Goals have stimulated new ways of thinking. Recently, rather than assume that there is no extreme poverty in high-income countries, as assessed by the international poverty line, World Bank aggregation has included survey estimates from high-income countries. However, because many of these countries use income as the monetary indicator of welfare, surveys conducted for those countries often report zero incomes, which yields poverty rates that may not be comparable with estimates based on consumption.

B. Monitoring poverty in all its dimensions

57. That the Sustainable Development Goals focus on ending poverty not only for all groups but also *in all its forms and dimensions*, attests to the recognition that poverty manifests itself in many ways. As already noted, so far, national and international approaches to monitoring poverty have measured mainly monetary poverty. However, many countries are also systematically monitoring other facets of poverty, such as the health, nutrition and education dimensions; and some have aggregated several dimensions into single measures of multidimensional poverty, often with a focus on "overlapping dimensions". The report of the Commission on Global Poverty emphasized the need for a portfolio of "complementary indicators" to be monitored along with the monetary poverty estimates. It suggests both a dashboard of such indicators and a measure of overlapping dimensions.

58. Because the Sustainable Development Goals set the target and indicators for measuring poverty in multiple dimensions in terms of national definitions, it is likely that the measures and methods used by countries will vary considerably, as do the methods and data used for tracking national monetary poverty. Further work will be necessary to ensure comprehensive documentation and a system of reporting of such statistics, and to assess the degree of international coordination that will be necessary in this regard.

C. Improving data availability and quality

59. While, today, the availability of international poverty statistics is greater, and their quality better, than ever before, the data gaps and the complexity of ensuring comparability suggest that there is considerable room for improvement. More frequent and more complete coverage of multi-topic household surveys will be an important first step, but in order to ensure that poverty estimates are more reliable and more comparable, attention should be paid not just to the quantity of surveys but also to their quality, accessibility and comparability.

60. For improved data quality, efforts will need to continue to focus on improved standards and training in the collection of household surveys; but there is also a need to expand efforts to test new technologies such as the recording of locations and land area with handheld Global Positioning System (GPS) devices, tablet-based questionnaires, integration of geospatial satellite data, and other innovations for improving data quality.[24] When data of good quality are not openly accessible, the ability of the data to inform policy discussion and debates is severely hindered. While the global community has placed emphasis on the importance of open data, even greater efforts are needed to push this agenda forward and create a common understanding of what the term *openly accessible data* really signifies. While such efforts may seem straightforward, countries in fact follow very different approaches to access. Some provide full public and immediate online access to their microdata; others may provide access to microdata after review and approval or after a fee has been paid. Regrettably, it is still the case that many countries continue to release data

[24] See chap. 5, entitled "National profiles of poverty and shared prosperity, data, and measurement issues", in World Bank, *A Measured Approach to Ending Poverty and Boosting Shared Prosperity: Concepts, Data, and the Twin Goals* (Washington, D.C., 2015). http://elibrary.worldbank.org/doi/book/10.1596/978-1-4648-0361-1.

only in processed tabular form, or not at all. The full value of survey data for improving poverty policy can be realized only through open access to the data.

61. Comparability is an issue of great importance for countries trying to monitor change over time or differences across diverse areas or across subsamples of their population. Comparability across countries also helps improve the scope for learning from experiences of neighbouring countries, and better allows for global assessments of progress in poverty reduction. To this end, the Intersecretariat Working Group on Household Surveys, whose establishment was endorsed by the Statistical Commission at its forty-sixth session in 2015 (see E/2015/24, chap. I, sect. C, decision 46/105), is making an important contribution. The Intersecretariat Working Group aims at fostering coordination and harmonization of household survey activities and improving the comparability and internal coherence of surveys both in a given country and across countries. Also relevant to the efforts to improve quality and comparability of poverty estimates based on consumption and expenditure data is the work of the Inter-Agency and Expert Group on Agricultural and Rural Statistics, which has developed guidelines for measuring food consumption and expenditures in household consumption and expenditure surveys, to be presented to the Statistical Commission at its forty-ninth session.[25] Such efforts to set standards and document good practice will be crucial to improving quality.

62. It is also important to accept the fact that estimates are almost by definition uncertain. The Commission on Global Poverty recommends that a "total error" approach be adopted in international poverty monitoring, which would recognize that there are a number of sources of imprecision, such as inaccuracies in population statistics, sample frames, and the growth rates used to bring poverty estimates to a common reference year; inaccuracies in the estimation of PPP exchange rates and national consumer price indices; and problems arising from variations in the methods used in different countries. Thus, the precise number of the poor in the world can be estimated only with some degree of uncertainty, as would be expected from such a large and dispersed statistical exercise.

D. Investing in more and better data

63. Conducting good household surveys for measuring poverty is both difficult and costly: it requires political commitment, professional capacity and adequate resources. It is estimated that conducting multi-topic household surveys for monitoring poverty in 78 of the poorest countries (390 surveys in total) will cost US$ 945 million every three years between 2016 and 2030.[26] A much larger sum will be needed to properly track the Sustainable Development Goal poverty indicators in all countries, especially to obtain data that can be disaggregated so as to provide a more complete picture and ensure that nobody is left behind.

64. In addition to financial resources, improved coordination between the donors who support surveys could increase the availability of poverty data.[27] Development organizations such as the Partnership in Statistics for Development in the

[25] See the report of the Food and Agriculture Organization of the United Nations on agricultural and rural statistics (E/CN.3/2018/13).

[26] Talip Kilic and others, "Costing household surveys for monitoring progress toward ending extreme poverty and boosting shared prosperity", World Bank Policy Research Working Paper, No. 7951 (Washington, D.C., World Bank, January 2017).

[27] Umar Serajuddin and others, "Data deprivation: another deprivation to end", World Bank Policy Research Working Paper, No. 7252 (Washington, D.C., World Bank, April 2015).

21st Century (PARIS21) encourage countries to prepare national strategies for the development of statistics, which can in turn inform donor investments. Such strategies typically include plans for regular household surveys. If national strategies for the development of statistics are implemented as intended, the frequency of production of poverty data can be increased through better coordination of survey instruments, without necessarily affecting overall survey costs.

65. Resources are fundamental to collecting more data, but are not alone sufficient. Country statistical capacity in survey questionnaire and sampling design, fieldwork management, data quality control, and data curation, analysis and dissemination is essential to informing evidence-based and data-driven efforts to eradicate poverty. In tae building of statistical capacity to meet the standard of international best practices, incorporating emerging, validated, innovative and cost-effective data-collection solutions, there must be recognition of the need to improve both household survey data and complementary data, e.g., on population and prices, if poverty statistics are to be meaningful.

VII. Action required by the Statistical Commission

66. The Statistical Commission is invited to take note of the present report.